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10/757,471	01/15/2004	Min-Chul Suh	1514.1039	4143

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EXAMINER

GARRETT, DAWN L

ART UNIT	PAPER NUMBER
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1774

MAIL DATE	DELIVERY MODE
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06/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/757,471

Applicant(s)

SUH, MIN-CHUL

Examiner

Dawn Garrett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 11-16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 5, 6 and 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/15/04 & 7/20/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to the amendment filed June 20, 2007. The amendment has been entered. Claims 11 and 18 were amended. Claims 1-16 and 18-21 are pending.
2. The finality of the Office action mailed March 23, 2007 is withdrawn.
3. The amendment to the abstract and specification dated June 20, 2007 is noted and has been entered.
4. The species elected with traverse under consideration remain as the following: A species of an electron acceptor material that is an aromatic compound having a nitro group and the species of an electron donor material that is an aromatic compound having a hydrogen. See prior Office actions.
5. The prior indication of allowable subject matter in claims 1-4, 7, and 18 is now withdrawn.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
7. Claims 7 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with

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which it is most nearly connected, to make and/or use the invention. The subject matter of claims 7 and 12 including variables "R", "R₂" and "R₃" is not described in the specification in such a way that one of ordinary skill in the art could make or use a compound having these undefined and non-described variables.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 7 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7 and 12 recite formulas comprising variables "R", "R₂" and "R₃". The variables are undefined and therefore considered indefinite.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 11-16 and 18- 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (EP 1017118 A2). Fujita et al. teaches organic electroluminescent elements comprising a light emitting layer between an anode and a cathode. Between the anode and the light emitting layer is a hole transporting layer containing a hole transporting material and an

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acceptor (with regard to claims 19 and 20). Between the light emitting layer and the cathode is an electron transporting layer containing an electron transporting material and a donor. (See abstract and the embodiment according to Figure 12, layer 71 (page 33) with description at page 9, par. 92). Electron transporting material inherently blocks holes, so this layer is deemed to read upon a "hole blocking layer". One of ordinary skill in the art recognizes that an electron transporting layer inherently has hole blocking properties as evidenced by Kobori (US 2002/0038867). Materials for the acceptor include compounds having a nitro group such as TNF (trinitrofluorenone) and DNF (dinitrofluorenone) (see par. 48) per the elected acceptor species comprising an aromatic compound with a nitro group. With regard to the electron donor material, Fujita et al. teaches condensed polycyclic compounds such as pyrene, perylene, anthracene, tetracene, and pentacene (see par. 75) per the donor species comprising an aromatic compound with hydrogen. The amount of donor material to electron transporting material (hole blocking material) is 1-20% by weight (see par. 76) per claim 13. The electron transporting layer (71) (i.e. hole blocking layer) is made by a method such as spin coating method per claim 15 (see par. 77, Figure 12). Fujita et al. teaches an electron transport layer (71) ("hole blocking layer") of 30 nm thickness (see Examples) per claim 16. With regard to claim 18, Fujita et al. teaches the individual layers of the device such as the electron transport/donor containing layer (71) may comprise multilayers (see page 9, par. 92). A multilayered layer (71) reads upon a hole blocking layer comprising donor material and a further electron transporting layer comprising donor material. With regard to claim 11, Fujita et al. also further teaches an electron transporting layer(s) comprising electron transporting material (see the embodiment of Figure 12, layer 7 described on page 9 at paragraph 92). Although Fujita et al. fails to *exemplify* devices

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with all of the taught acceptor materials comprising an aromatic compound with a nitro group and donor materials comprising aromatic compounds with hydrogen, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed a device as recited in the claims and to have selected the electron acceptor and electron donor materials under consideration, because Fujita et al. teaches all of the required components of the devices of the claims.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-4 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 and 10 of copending Application No. 10/839,338. Although the conflicting claims are not identical, they are not patentably distinct

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from each other because claim 1 of '338 requires the same layers as claim 1 of the instant application and recites "at least one of a hole injecting layer and a hole transporting layer" comprises an electron acceptor material. Instant claim 2 sets forth aromatic, olefin, and heterocyclic compounds having cyano or nitro groups, which encompasses '338 claims 2-5 materials. The limitations of instant claim 3 are set forth in '338 claims 6 and 7. The limitations of instant claim 4 are set forth in '338 claim 10.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented. It is noted that a terminal disclaimer was filed over the current application in the US 10/839,338 application; however, the terminal disclaimer was disapproved according to the document dated April 21, 2006 in the US 10/839,338 electronic application file.

Allowable Subject Matter

14. Claims 5, 6, and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 21 is allowed. Reasons for the indication of allowable subject matter in these claims have been previously set forth in the prior Office action.

Response to Arguments

15. Applicant's arguments filed June 20, 2007 have been fully considered but they are not persuasive.

With further regard to the arguments discussed in the interview on June 14, 2007, the examiner maintains the layer according to Fujita comprising electron transporting material and donor material would inherently have a hole blocking function and read upon a "hole blocking layer", because it is known to one of ordinary skill in the art that electron transporting material comprises a hole blocking function as evidenced by Kobori et al. (US 2002/0038867), par. 192. The examiner further notes several places in the instant specification make reference to "a hole blocking layer and/or an electron transfer layer" which could be interpreted as describing a single layer having both functions, and paragraph [0034] teaches the same material for the layer(s). Also, teachings such as in paragraph [0043] indicate that a separate electron transporting layer is optional, which implies that the hole blocking layer and electron transporting layer may be one and the same.

Applicant appears to argue the exact term "hole blocking layer" must be used in the prior art in order for the claims to be rejected over the art. The examiner maintains that the electron transporting layer described by Fujita et al. reads upon the hole blocking layer of the instant claims, because they contain the same types of materials and are not distinguished over one another.

Applicant argues the examiner has not given "hole blocking layer" its plain meaning. The examiner again submits that applicant has not distinguished the material of a hole blocking layer as different from an electron transporting layer. No clear distinction has been made with respect to composition or specific properties in the claims. Applicant bears responsibility for proving that a reference composition does not possess the characteristics recited in the claims. *In re Fitzgerald*, 205 USPQ 597, *In re Best*, 195 USPQ 430.

Applicant argues Fujita et al. does not teach “an electron injection layer”. It is respectfully noted that “an electron injection layer” is not required by claim 11. The claim only requires one layer selected from a hole blocking layer and electron injection layer.

The examiner respectfully disagrees with applicant’s argument with respect to claim differentiation. Applicant has not distinguished the material of a hole blocking layer as different from an electron transporting layer. No clear distinction has been made with respect to composition or specific properties in the claims. Again as stated above, several places in the instant specification make reference to “a hole blocking layer **and/or** an electron transfer layer” which could be interpreted as describing a single layer having both functions, and paragraph [0034] teaches the same material for the layer(s). Also, teachings such as in paragraph [0043] indicate that a separate electron transporting layer is optional, which implies that the hole blocking layer and electron transporting layer may be one and the same.

Further with respect to applicant’s arguments regarding the doctrine of claim differentiation, the rejection set forth in this Office action points to the Fujita et al. embodiment of Figure 12 having both a layer (71) with electron transporting (hole blocking) material and donor material and a layer (7) that is an electron transporting layer. Further, par. 92 teaches each of the individual layers may comprise multilayers, so layer (71) may comprise two separate layers.

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Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571) 272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Dawn Garrett
Primary Examiner
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June 26, 2007